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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,282	12/12/2003	Philippe Le Tourneur	246399US6	8244
22850	7590	12/05/2006	EXAMINER	
C. IRVIN MCCLELLAND OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			MONDT, JOHANNES P	
			ART UNIT	PAPER NUMBER
			3663	

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/733,282

Applicant(s)

LE TOURNEUR, PHILIPPE

Examiner

Johannes P. Mondt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-13, 16 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) 3-4 and 6-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 6, 8, 10-13, 16 and 18-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 November 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

Amendment filed 11/09/06 under 37 C.F.R. 1.116 has been entered in light of applicant's arguments. The finality of the office action mailed 8/9/06 has been withdrawn and a non-final office action is herewith provided. Comments on Remarks submitted with said Amendment are included below under "Response to Arguments".

Specification

The Amendment to the Specification has been approved, because "pseudo-random" is not random, as explained in the previous office action. Examiner emphasizes that although "pseudo-random" may give an impression of randomness no randomness is involved and hence any "pseudo-random" manner in which said plurality of holes are placed can be given patentable weight in the claims.

Drawings

1. The replacement sheet for the Drawing of Figure 8C as filed with said Amendment on 11/09/06 is objected to for introducing new matter. Figure 8C as originally filed is not in contradiction with the disclosure through obvious error, because, although the neutron-emissive parts (equivalent to emissive blocks 17 in Figure 4B, e.g.) of in Figure 8C can be reached by the particles of the particle beam (deuterons) only through traversing the equivalent of the non-emissive support 14 (see Figure 4B, e.g.) there is no statement anywhere in the specification that the side of the target with the neutron-emissive blocks 17 must face the ion beam 55, nor is there any thickness of said non-emissive support

disclosed that would render the invention not enabled in the alternative depicted in Figure 8C. Although the invention could thus conceivably be carried out with the configuration depicted in Figure 8C, said configuration has not been disclosed anywhere in the original specification including original Drawings and hence constitutes new matter.

2. Figures 1A and 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. ***Claims 1, 8, 10, 12, 13, 16, 18, 20 and 21*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cluzeau (FR 2738669) (as cited previously; IDS;

N.B.: reference is made to a translation provided by the PTO) in view of Fujimura (4,426,722) (IDS).

On claim 1: Cluzeau teaches a target 29 (abstract, page 2, line 16 – page 4, line 3) capable to emit neutrons when bombarded with particles (in particular, ion beam 27 (see abstract)), comprising:

neutron emissive parts (because tritium is included in the material of which target 29 is made.

Cluzeau does not necessarily teach the limitation of neutron non-emissive parts with only the neutron emissive parts emitting neutrons during bombardment with said particle, said emissive and non-emissive parts being arranged so as to form a pattern as a coded mask.

*However, it would have been obvious to include said limitation in view of Fujimura (4,426,722) (IDS), who, in a patent on charged-particle beam targets for the production of radiographic (i.e., "radiation other than visible light": see Merriam-Webster's Collegiate Dictionary, tenth Edition, page 963) particle beams (in particular, x-ray beams) (see title, abstract and col. 1, l. 4-35), hence analogous art, teaches the target 535 for the charged-particle beam to have radiographic particle emissive parts 530 embedded in a material 510 (copper) not engaged in the emission of the radiographic particles (Figure 5 and col. 3, l. 23-31). See also, in alternative rejection on target, target 135 (Figure 1) with radiographic particle emissive spots 130 on metallic anode 140 (col. 2, l. 7-48). Please note that only the x-ray emissive spots are used for the emission of the x-rays (col. 2, l. 49-58). *Motivation to include the teaching by**

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Fujimura in the invention by Cluzeau at least derives from the advantages flowing from the replacement of a single, diffuse beam by a plurality of spatially sharply defined beams given more spatially precise information about the sample (see col. 1, l. 5-34 and col. 2, l. 49-62 in Fujimura).

On claim 8: the invention by Cluzeau is a particle accelerator (Penning ion source 26 (page 14, line 23 - page 5, line 3) with accelerating electrode 26, loc.cit.)) comprising a target according to claim 1 (see rejection of claim 1).

On claim 10: Cluzeau teaches a particle accelerator 26/28 according to claim 8 that it is equipped with α - particle detector (35 or 15/35) (see abstract, first sentence, Figures 1 and 2) associated with the emission of neutrons (the alpha particles and neutrons are emitted in opposite directions and through the same nuclear reaction ${}^3\text{H}(\text{d},\text{n}){}^4\text{He}$ (page 2) by conservation of linear momentum).

On claim 12: in the combined invention as defined by Cluzeau modified by replacement of elements 29 with the integrated target/coded mask as taught by Fujimura the target of claim 10 is inclined in relation to the direction of the particles (in the ion beam 27) that are bombarding it (see Figure 2).

On claim 13: in said combined invention the target of the particle accelerator according to claim 10 is substantially parallel to the α particle detector 35 (Figure 6).

On claims 16 and 18: The device defining by said combination of Cluzeau and Fujimura contains a neutron generating tube 21 comprising a target and is equipped with a particle detector 15/35 associated with the emission of neutrons (the alpha

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particles and neutrons are emitted in exactly opposite directions and through the same nuclear reaction ${}^3\text{H}(\text{d},\text{n}){}^4\text{He}$ (page 2) by conservation of linear momentum).

On claim 20: the target is inclined in relation to the direction of the particles (in the ion beam 27) that are bombarding it (see Figure 2).

On claim 21: the target in the combined invention is substantially parallel to the α particle detector 35 (Figure 6).

1. **Claims 2, 5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cluzeau and Fujimura as applied to claim 1, and further in view of Fabian (German patent document 2053881) (made of record in IDS as item AP and previously cited).

On claim 2: Claim 1 is unpatentable over Cluzeau in view of Fujimura, as detailed above.

Cluzeau teaches the emissive part to be formed of titanium.

Cluzeau does not necessarily teach the further limitation that said emissive part to be formed from at least one metal hydride deposited on a support in non-hydrogen fixing material through a stencil.

However, it would have been obvious to include said further limitation in view of Fabian, who, in a patent document on neutron targets, hence analogous art, teach as ordinary in the art the selection of a target of titanium hydride deposited on a non-hydrogen fixing material (copper) (see page 2, first paragraph).

In reference to the claim language referring to "formed... through a stencil", intended use and other types of functional language must result in a structural

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difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963).

Motivation to include the teaching by Fabian on metal hydride in the invention by Cluzeau derives from the advantage to impregnate the best metal for this purpose (see page 2, third paragraph) with high hydrogen content so as to increase the density of the true targets, which are the hydrogen isotope atoms therein while copper has the desired high thermal conductivity, as expressed by Fabian (page 2, first paragraph).

On claim 5: in the combined invention as detailed and rendered obvious above under claim 2 the non-fixing material of the support is copper (see Fabian, page 2, first paragraph).

On claim 6: In the combined invention the metal of the metal hydride is titanium, thus meeting this further limitation.

2. **Claims 11 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cluzeau and Fujimura as applied to claim 10, and further in view of Kassing (DE 3049153 A1) (previously cited).

On claim 11: Claim 10 is unpatentable over Cluzeau in view of Fujimura, as detailed above. Cluzeau does not necessarily teach the further limitation defined by claim 11.

However, it would have been obvious to include said further limitation in view of Kassing, who, in the art of alpha particle detectors teach the alpha particle detector to be a semiconductor storage matrix (claim 1 in Kassing) (see also Derwent translation of

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abstract and equivalent abstract included herewith) connected to an electrical circuit.

The pixels by definition are the units of electrical response to the detected alpha particles. *Motivation* to include the teaching by Kassing derives from the efficient spatial resolution obtained in the semiconductor alpha particle detector.

On claim 19: Cluzeau does not necessarily teach the further limitation defined by claim 19. *However, it would have been obvious to include said further limitation in view of Kassing, who, in the art of alpha particle detectors teach the alpha particle detector to be a semiconductor storage matrix (claim 1 in Kassing) (see also Derwent translation of abstract and equivalent abstract included herewith) connected to an electrical circuit.* The pixels by definition are the units of electrical response to the detected alpha particles. *Motivation* to include the teaching by Kassing derives from the efficient spatial resolution obtained in the semiconductor alpha particle detector.

Response to Arguments

Applicant's arguments, see Remarks submitted with Amendment filed 11/09/06, with respect to the rejection of claims 1, 2, 5, 6, 8, 10-13, 16 and 18-21 have been fully considered and are persuasive. The finality of the office action mailed 8/19/06 has been withdrawn.

In particular, although counter to applicant's argument on page 9 replacement of an element (36) by another element (65) near target material (29) does not necessarily imply the same position of said element; and although the relative orientation of elements 29 and 65 (tritium containing target material 36 and coded mask 65) are

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clearly indicated to be parallel in Figure 6, explicit teachings of both the relative positions *and* orientations of 36 and 65 appear absent in Cluzeau. Only if 29 and 65 are both "very near" as indicated by Figure 6 (as explicitly assumed for the embodiment of Figure 2; see page 16 of the translation of Cluzeau) and parallel (as at least strongly suggested by Figure 6 in Cluzeau) would 29 together with 65 form a target intended to emit neutrons with neutron emissive parts (in 29) and neutron-non-emissive parts (65), considering the angle of 45 degrees of the ion beam with target material 29 and that the entire slab of the tritium containing target material 29 is involved in the neutron production. Cluzeau does not make an explicit statement in that regard.

However, the above-described aspect absent in unambiguous, explicit teaching by Cluzeau would have been obvious, as an obvious improvement over the invention defined by Figure 2 in Cluzeau in view of Fujimura (4,426,722) (IDS), who, in a patent on charged-particle beam targets for the production of radiographic particle beams (in particular, x-ray beams) (see title, abstract and col. 1, l. 4-35), hence analogous art, teaches the target 535 for the charged-particle beam to have radiographic particle emissive parts 530 embedded in a material 510 (copper) not engaged in the emission of the radiographic particles (Figure 5 and col. 3, l. 23-31). See also, in alternative rejection on target, target 135 (Figure 1) with radiographic particle emissive spots 130 on metallic anode 140 (col. 2, l. 7-48). Please note that only the x-ray emissive spots are used for the emission of the x-rays (col. 2, l. 49-58). Note also that both reflection and transmission type targets are taught (col. 1, l. 37-52 and col. 3, l. 17-21).

Motivation to include the teaching by Fujimura in the invention by Cluzeau at least derives from the advantages flowing from the replacement of a single, diffuse beam by a plurality of spatially sharply defined beams given more spatially precise information about the sample (see col. 1, l. 5-34 and col. 2, l. 49-62 in Fujimura).

Although the rejection is herewith substantially amended the following comments are offered in response to Remarks submitted with said Amendment in as far as said Remarks are still relevant for the present rejection.

(a) Remarks on the rejection over Cluzeau up to page 10, "the target of Cluzeau does not comprise neutron non-emissive parts" is persuasive but rendered moot by the rejection over Cluzeau in view of Fujimura, as explained overleaf.

(b) Remarks that Cluzeau does not code the neutron beam but codes only the α particle beam (page 11) is irrelevant for the rejection as included overleaf, because the radiographic particle beam is coded following Fujimura who cites his motivation specifically as an improvement of art such as that of Cluzeau in which the entire surface of the target emits neutrons (col. 2, l. 49-63). Even arguendo, because both α particles and neutrons are emitted from the same target, and, in view of the far greater kinetic energy of the reaction products (n, α) in comparison with the deuteron beam ions, essentially isotropically, coding of one necessarily means coding of the other. Furthermore, "coding" of one or the other beam is a functional limitation and is of zero patentable weight in the invention of a target, i.e., a device, of applicant. Intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed

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invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963).

(c) Comments (page 12) on the ion beam in relation to the mask 65 in a second embodiment by Cluzeau are moot in view of the new rejection, in which mask 65 does not feature at all.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPM

December 1, 2006

Patent Examiner:

A handwritten signature in black ink, appearing to read 'J. Mondt', is written over the printed name.

Johannes Mondt (Art Unit: 3663)